

CLAIMS

1. A switching power supply provided with a control switch, a synchronous switch and a series connection of an output inductor and a smoothing capacitor, wherein the input of an error amplifier is connected to the output of a power supply circuit to amplify the error between detected voltage and reference voltage, the output of said amplifier is connected an input of a first comparator and an input of a second comparator through split resistors, a filter circuit comprising resistors and a capacitor is connected in parallel to said synchronous switch, and the output of said filter circuit is connected to another input of said first comparator and another input of said second comparator, wherein a control means is configured to control the amplitude of the triangular waveform obtained through said filter circuit to be between an input level of said first comparator and an input level of said second comparator.
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- 10 2. A switching power supply according to Claim 1, wherein said control means is configured by connecting the output of said error amplifier to another input of said second comparator through a voltage divider circuit which changes the voltage division ratio freely, to control the amplitude of the triangular waveform obtained through said filter circuit to be between an input level of said first comparator and an input level of said second comparator
- 15 3. A switching power supply according to Claim 2, wherein three or more resistors are connected in series to form a voltage divider variable part and a voltage divider fixed part, one end of said voltage divider variable part is connected between the output of said error amplifier and the input of said first comparator, the other end of said voltage divider variable part is connected to another input of said second comparator, and a switch is connected in parallel with at least one resistor provided at said voltage divider variable part, wherein the discontinuity of inductor current is detected to change the voltage division ratio freely.
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- 25 4. A switching power supply according to Claim 1, wherein a current source changing in proportion with the I/O potential differenceis provided, said current

source being connected between the middle point of said split resistors and the ground potential to generate a second signal, wherein said amplitude of the triangular waveform is controlled to be between signals of said first comparator and said second comparator.

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5. A switching power supply according to Claim 4, wherein two or more said split resistors are connected in series and current source changing in proportion with I/O potential difference is connected between the resistance cutoff point and the ground potential, wherein the voltage division ratio can be changed freely.

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6. A switching power supply according to Claim 1, wherein the amplified error signal obtained by amplifying the error between output voltage of the power supply circuit and reference voltage is compared with the triangular waveform obtained through said filter circuit and then a first comparison signal is sent to said control switch, said amplified error signal is divided and then compared with said second triangular waveform for generation of a second comparison signal, said second comparison signal is compared with the clock signal to generate said second comparison signal where there is a sharp change of the load, to change the output signal for said control switch from said clock signal to said second comparison signal to control said amplitude of the triangular waveform to be between said amplified error signal and said voltage division signal, wherein the timing of said control switch is fixed to ON by said clock signal.

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7. A switching power supply according to Claim 6, wherein the timing of said control switch is fixed to ON by said clock signal even when there is a sharp increase of the load.

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8. A switching power supply according to Claim 1, wherein said first comparison signal can be generated by comparing the amplified error signal obtained by amplifying the error between of output voltage of the power supply circuit and reference voltage with the triangular waveform obtained through said filter circuit, said first comparison signal is compared with the clock signal and then sent to said

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control switch, said amplified error signal is divided and then compared with said triangular waveform to generate said second comparison signal, wherein when there is a sharp change of the load, output signal for said control switch is changed from said clock signal to said first comparison signal to control the amplitude of said triangular waveform to be between said amplified error signal and said voltage division signal when there is a sharp change of the load, and the timing of said control switch is fixed to OFF by said clock signal in the steady state.

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9. A switching power supply according to Claim 8, wherein the timing of said control switch is fixed to OFF by said clock signal even when there is a sharp decrease of the load.

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